AMENDMENT TO THE CLAIMS

Please replace the present claims with the following amended claims:

1. (Currently Amended) Signal processing method using a MAP (Maximum A Posteriori) type algorithm to determine a likelihood ratio Λ_k^x of a set of states X of a lattice at instant k, each of the said states being associated with at least one intermediate variable, belonging to the group including a so-called "forward" variable and a so-called "backward" variable, propagated by the said MAP algorithm and calculated recursively, in a direct direction and in an indirect direction respectively at the said instant k with respect to the said lattice, wherein the method comprises:

reducing the number of states selected by the said MAP type algorithm so as to calculate the said likelihood ratio;

calculating said likelihood ratio for the selected states;

assigning at least one determined value to the corresponding said forward and/or backward variable, so as to calculate an approximate likelihood ratio, at least for some non-selected states; and

calculating said approximate likelihood ratio at least for some non-selected states<u>; and</u>

<u>wherein at a given instant k, said at least one determined value a(k) assigned to said forward variable is smaller than a minimum value of said forward variable at said instant k and/or said at least one determined value b(k) assigned to said backward variable is smaller than a minimum value of said backward variable at said instant k</u>.

2. (Previously Presented) Method according to claim 1, wherein at a given instant K, the said at least one determined value a(k) assigned to the said forward variable is such that $0 \le a(k) \le \underset{i \in M_k^f}{Min}(a_i^k)$, and/or the said at least one determined value b(k) assigned to the said backward variable is such that $0 \le b(k) \le \underset{i \in M_k^b}{Min}(\beta_i^k)$, where M_k^f and M_k^b represent a set of the said

states selected in the said direct direction and in the said indirect direction respectively at the said instant k, and where a_i^k and β_i^k represent the said froward and backward variables respectively at the said instant k.

3. (Previously Presented) Method according to claim 2, wherein at a given instant k, the said determined value a(k) and/or b(k) is unique and is assigned to at least one forward variable a_i^k and/or backward variable β_i^k.

4. (Previously Presented) Method according to claim 1, wherein a constant value is assigned to the said forward and backward variables respectively, such that the said MAP type algorithm is a single-directional direct or indirect type algorithm respectively.

5. (Previously Presented) Method according to claim 1, wherein the said step to reduce the number of states uses a "breadth-first" type lattice search algorithm.

6. (Previously Presented) Method according to claim 5, wherein the said "breadth-first" type algorithm is an M type algorithm.

7. (Previously Presented) Method according to claim 5, wherein the said "breadth-first" type algorithm is a T type algorithm using at least one threshold.

8. (Previously Presented) Method according to claim 7, wherein the said at least one threshold is variable as a function of the said instant k.

9. (Previously Presented) Method according to claim 8, wherein a predetermined value is assigned to the said variable threshold for each instant k.

10. (Previously Presented) Method according to claim 8, wherein for each instant k, the value

of the said variable threshold is determined by the use of an adaptive algorithm.

11. (Previously Presented) Method according to claim 10, wherein the said adaptive algorithm is a gradient type algorithm.

12. (Previously Presented) Method according to claim 10, wherein since the said lattice comprises a plurality of nodes each associated with one of the said states and at a given instant k, the value of the said variable threshold T at an instant (k+1) is determined by the following equation:

$$T(k+1) = T(k) - \mu(M(k) - M_c)$$

where T(k) represents the value of the said variable

threshold at the said instant k, M_c is the target number of propagated nodes in the said lattice, M(k) is the number of propagated nodes in the said lattice at instant k, and μ is a positive constant representing a learning gain.

13. (Previously Presented) Method according to claim 11, wherein the said adaptive algorithm is a gradient type algorithm with variable pitch.

14. (Previously Presented) Method according to claim 12, wherein the said learning gain μ is a function of the said instant k.

15. (Previously Presented) Method according to claim 2, wherein the said step to reduce the number of states uses an M type "breadth-first" lattice search algorithm, and the said determined values a(k) and/or b(k) assigned to the said "forward" and/or "backward" variables respectively, at a given instant k are given by the following equations:

$$a(k) = \underset{i \in M_k^f}{Min}(a_i^k) - c_f$$

$$b(k) = \underset{i \in M_k^b}{Min}(\beta_i^k) - c_b$$

where c_f and c_b are two positive constants.

16. (Previously Presented) Method according to claim 2, wherein the said step to reduce the number of states uses a T type "breadth-first" lattice search algorithm, and the said determined values a(k) and/or b(k) assigned to the said forward and/or backward variables at a given instant k respectively, are given by the following equations:

$$a(k) = T^f(k) - c_f$$

$$b(k) = T^b(k) - c_b$$

where c_f and c_b are two positive constants, and where

$T^f(k)$ and $T^b(k)$ denote the value of the said variable

threshold at said instant k in the said direct direction and in the said indirect direction respectively.

17. (Previously Presented) Method according to claim 1 the said MAP type algorithm belongs to the group consisting of:

-MAP type algorithms;

-Log-MAP type algorithms; and

-Max-Log-MAP type algorithms.

18. (Previously Presented) Method according to claim 4, wherein since the said MAP type algorithm is a single-directional algorithm, the said method uses a step to compare decisions made by the said single-directional algorithm with the corresponding decisions made by a Viterbi type algorithm, called Viterbi decisions.

19. (Previously Presented) Method according to claim 18, wherein in the case of a negative comparison for at least one of the said decisions made by the said single-directional algorithm, the said method uses a substitution step for the said Viterbi decision corresponding to the said decision made by the said single-directional algorithm, called the substituted decision.

20. (Previously Presented) Method according to claim 19, wherein a determined value V is assigned to the absolute value of the said likelihood ration associated with the said substituted decision.

21. (Previously Presented) Method according to claim 20, wherein the said determined value V is equal to the absolute value of the average likelihood ratio of the sequence.

22. (Previously Presented) Method according to claim 18, wherein in the case of a negative comparison for at least one of the said decisions made by the said single-directional algorithm, the said method uses a step for weighting the said likelihood ratio associated with the said decision considered, taking account of the said Viterbi decision.

23. (Previously Presented) Method according to claim 22, wherein when Y is a set of states associated with a decision D_i^Y output by the said Viterbi type algorithm at instant i, and Λ_i^y represents the likelihood ratio associated with Y at instant i as calculated by the said single-directional algorithm during the said weighting step, the value of Λ_i^y is replaced by the $\tilde{\Lambda}_i^Y$ defined by $\tilde{\Lambda}_i^Y = \Lambda_i^y + D_i^Y xV$, where V is a determined value.

24. (Previously Presented) The method of claim 1 and further comprising performing said method in a domain belonging to the group consisting of:

-symbol detection;

-signal coding/decoding;

-turbo-decoding;

-turbo-detection; and

-source coding by quantification in lattice.

25. (Currently Amended) A communication signals receiver comprising means for implementing a MAP (Maximum A Posteriori) type algorithm to determine a likelihood ratio Λ_k^X of a set of states X of a lattice at instant k, wherein each of the said states is associated with at least one intermediate variable belonging to the group comprising a so-called "forward" variable and a so-called "backward" variable propagated by the said MAP algorithm and calculated recursively in a direct direction and in an indirect direction respectively at the said instant k with respect to the said lattice, wherein the means for implementing the MAP type algorithm further comprises:

means of reducing the number of states selected by the said MAP type algorithm in order to make a calculation of the said likelihood ratio,

means of calculating said likelihood ratio for the selected states, for at least some non-selected states,

means for assigning at least one determined value to the corresponding said forward variable and/or backward variable, so as to calculate an approximate likelihood ratio,

means of calculating said approximate likelihood ratio at least for some non-selected states; and

wherein at a given instant k, said at least one determined value a(k) assigned to said forward variable is smaller than a minimum value of said forward variable at said instant k and/or said at least one determined value b(k) assigned to said backward variable is smaller than a minimum value of said backward variable at said instant k.